



Daffodil International University
 Faculty of Science & Information Technology
 Department of Computer Science & Engineering
 Final Examination, Fall 2025

Course Code: CSE328, Course Title: Introduction to Data Science
 Level: 3 Term: 2 Batch: 64

Time: 02:00 Hrs Marks: 40

Answer ALL Questions
 [The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

S  nario 1: Two data scientists aim to predict whether a mango will have Good Sales or Poor Sales based on its physical and qualitative attributes. Each mango is described by a set of features collected at harvest. As a Data Scientist, your Task is to help them.

Sweetness (in 1000s)	Skin Defects (in %)	Sales
7.2	3 10.025	Good
5.9	12	Poor
8.5	2	Good
15.11	42	Poor
7.9	5	Good
6.1	10	Poor
8.1	4	Good

11-11
5th

1.	Apply the necessary data preprocessing techniques to transform the given mango dataset into a clean, consistent, and analysis-ready form and select suitable rows for further investigation.	[10]	CO1
2.	Find the value of Skin Defects(%) given the Sweetness(1000s) is 5.2 for a new mango based on the preprocessed dataset. Use this value of Skin Defects(%) to calculate if the mango will have Good Sales or Poor Sales considering the threshold of 0.5 (Poor < 0.5 <= Good)	[10]	CO2
3.	Based on the preprocessed dataset we observe the frequency of Good Sales vs Poor Sales for the samples. Now determine the probability of a mango having Good Sales for the given samples. Also, calculate the probability that if a new batch of 5 mangoes is harvested exactly 3 of them will have Good Sales.	[10]	CO3

500
 1.571 (1-0.571)

Skin defects in a shipment of mangoes follow a normal distribution with mean $\mu = 12\%$ and standard deviation $\sigma = 4\%$. Management is considering rejecting mangoes with more than 20 percent defects.

4.	Analyze whether the threshold of 20 percent skin defects is a reasonable rejection rule by using the basic properties of the normal distribution. Explain your reasoning without using any statistical tables.	10	CO3
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0.63

$$\frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

0.978